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EXAMINER	
COUGHLAN, PETER D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,032	HAUDRICH ET AL.	
	Examiner	Art Unit	
	Peter Coughlan	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 17-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 17-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/14/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. This office action is in response to an AMENDMENT entered July 9, 2007 for the patent application 10/825032 filed on April 14, 2004.

2. All previous Office Actions are fully incorporated into this Final Office Action by reference.

Status of Claims

3. Claims 1-13, 17-50 are pending.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5-12, 17-20, 31-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over NMAB_497, in view of Mehrotra. ('Small business innovation research to support aging aircraft', referred to as **NMAB_497**; 'Elements of Artificial Neural Networks', referred to as **Mehrotra**)

Claim 1

NMAB-497 teaches an input module configured to receive one or more input parameters associated with aeroelastic characteristics of a structure, the one or more input parameters relating to a completed repair of the structure (**NMAB-497,** p11:8-25; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497.); and a neural network module coupled to the input module (**NMAB-497,** p41:3 through p43:28; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.), and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic analysis result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.)

NMAB-497 does not teach the transformation based in part on a trained neural network.

Mehrotra teaches the transformation based in part on a trained neural network. (**Mehrotra,** p103:1 through p104:16; 'Trained neural network' of applicant is accomplished by 'back propagation' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's

invention to modify the teachings of NMAB-497 by training a neural network as taught by Mehrotra to have the transformation based in part on a trained neural network.

For the purpose of having a neural network that can be altered for different applications

NMAB-497 teaches wherein the at least one aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable. (**NMAB-497,** p41:3 through p43:28; 'Determine ... aeroelastic characteristics ... repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 2

NMAB-497 teaches an output module coupled to the neural network module, and configured to output the at least one aeroelastic analysis result. (**NMAB-497,** p41:3 through p43:28, p29-3 through p30:31; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497. Neural networks have outputs. 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.)

Claim 5

NMAB-497 teaches wherein the one or more input parameters comprise: a weight; and a location of the weight on the structure. (**NMAB-497,** p11:8-25;

'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

Claim 6

NMAB-497 does not teach a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters; a bias module configured to provide a scalar bias value a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias value; and a transfer function module coupled to the summer and configured to apply a transfer function to the sum.

Mehrotra teaches a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters (**Mehrotra,** p11, Figure 1.5; 'Weight vector module' of applicant is equivalent to 'the input nodes in which the values x_1 through x_n are placed.); a bias module configured to provide a scalar bias value (**Mehrotra,** p11, Figure 1.5; 'Bias module' of applicant is the weights w_1 through w_n of Mehrotra.) a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias

value (**Mehrotra,** p11, Figure 1.5; The 'summer' of applicant is the summation of the products of all the x_is and w_is in node 'f' of Mehrotra.); and a transfer function module coupled to the summer and configured to apply a transfer function to the sum. (**Mehrotra,** p11, Figure 1.5; The 'transfer function' of applicant is equivalent to '$f(w_1x_1 + \ldots + w_nx_n)$' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using basic principles of neural networks as taught by Mehrotra to have a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters; a bias module configured to provide a scalar bias value a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias value; and a transfer function module coupled to the summer and configured to apply a transfer function to the sum.

For the purpose of using the neural network's property of pattern recognition.

Claim 7

NMAB-497 does not teach wherein the transfer function comprises a non-linear transfer function.

Mehrotra teaches wherein the transfer function comprises a non-linear transfer function. (**Mehrotra,** p130:1 through p133:2; A example of a 'non-linear transfer function' of applicant is equivalent to 'function such as the hyperbolic

tangent' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a transfer function to determine indication of a pattern as taught by Mehrotra to have the transfer function comprises a non-linear transfer function.

For the purpose of providing a on or off indicator to the input parameters.

Claim 8

NMAB-497 does not teach wherein the transfer function comprises a tangent sigmoid function.

Mehrotra teaches wherein the transfer function comprises a tangent sigmoid function. (**Mehrotra,** p130:1 through p133:2; A example of a 'non-linear transfer function' of applicant is equivalent to 'function such as the hyperbolic tangent' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a sigmoid function as taught by Mehrotra to have the transfer function comprises a tangent sigmoid function.

For the purpose of using established neural networks function for reliable results.

Claim 9

NMAB-497 does not teach at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function. Mehrotra teaches at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function. (**Mehrotra,** p13:10 through p14:12; 'Sigmoid' of applicant is equivalent to 'sigmoid function' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a hyperbolic tangent function as taught by Mehrotra to have at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function. For the purpose of using a variant of the sigmoid function for different applications.

Claim 10

NMAB-497 teaches wherein the at least one aeroelastic analysis result comprises a flutter frequency at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this

is the flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 11

MAB-497 teaches wherein the at least one aeroelastic analysis result comprises a flutter speed at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this is the flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 12

NMAB-497 teaches wherein the at least one aeroelastic analyses result comprises a flutter frequency and a corresponding flutter speed at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this is the flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 17

NMAB-497 teaches determining input parameters relating to one or more completed repairs performed on a structure. (**NMAB-497,** p11:8-25; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497.)

NMAB-497 does not teach determining a training set of characteristic I/O pairs.

Mehrotra teaches determining a training set of characteristic I/O pairs. (**Mehrotra,** p103:1 through p104:16; 'Training set of characteristic I/O pairs' of applicant is equivalent to 'back propagation' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using pairs of information to train the neural network as taught by Mehrotra to have a determining a training set of characteristic I/O pairs.

For the purpose of associating a result with a given input values.

NMAB-497 teaches generating a neural network. (**NMAB-497,** p41:3 through p43:28; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.)

NMAB-497 does not teach training the neural network using the training set to generate a trained neural network; and determining aeroelastic characteristics of the structure based in part on the trained neural network.

Mehrotra teaches training the neural network using the training set to generate a trained neural network (**Mehrotra,** p103:1 through p104:16; 'Trained

neural network' of applicant is accomplished by 'back propagation' of Mehrotra.); and determining aeroelastic characteristics of the structure based in part on the trained neural network. (**Mehrotra,** p103:1 through p104:16, , p29-3 through p30:31; 'Trained neural network' of applicant is accomplished by 'back propagation' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by train the neural network to identify aeroelastic characteristics as taught by Mehrotra to have the neural network using the training set to generate a trained neural network; and determining aeroelastic characteristics of the structure based in part on the trained neural network.

For the purpose of using the neural network ability for pattern identification of detecting aeroelastic characteristics.

NMAB-497 teaches determining whether the aeroelastic characteristics (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic characteristics' of applicant is equivalent to 'aeroelasticity' of NMAB-497.) of the structure with the one or more completed repairs are acceptable. (**NMAB-497,** p41:3 through p43:28; 'Repairs are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 18

NMAB-497 does not teach determining an accuracy of the aeroelastic characteristics determined using the trained neural network. Network.

Mehrotra teaches determining an accuracy of the aeroelastic characteristics determined using the trained neural network. Network. (**Mehrotra,** p103:1 through p104:16, , p29-3 through p30:31; 'Trained neural network' of applicant is accomplished by 'back propagation' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a neural network as taught by Mehrotra to determine an accuracy of the aeroelastic characteristics determined using the trained neural network. Network.

For the purpose of being able to generate aeroelastic indicators.

Claim 19

NMAB-497 does not teach determining a weight vector in the trained neural network; and determining a bias value in the trained neural network.

Mehrotra teaches determining a weight vector in the trained neural network (**Mehrotra,** p11, Figure 1.5; 'Weight vector module' of applicant is equivalent to 'the input nodes in which the values x_1 through x_n are placed.); and determining a bias value in the trained neural network. (**Mehrotra,** p11, Figure 1.5, p65:1-33; 'Bias module' of applicant is the weights w_1 through w_n of Mehrotra. The 'trained neural network' is accomplished by 'backpropagation' method of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using standard components of a neural network as taught by

Mehrotra to have a weight vector in the trained neural network; and determining a bias value in the trained neural network.

For the purpose of being able to train the neural network by altering the weights.

Claim 20

NMAB-497 does not teach multiplying received input parameters by the weight vector to generate weighted parameters; summing the weighted parameters and the bias value to generate a summed input; and applying the summed input to a transfer function associated with a neuron in the trained neural network.

Mehrotra teaches multiplying received input parameters by the weight vector to generate weighted parameters (**Mehrotra,** p11, Figure 1.5; The 'Multiplying received input parameters' of applicant is the multiplication of each x_is and w_is in node 'f' of Mehrotra.); summing the weighted parameters and the bias value to generate a summed input (**Mehrotra,** p11, Figure 1.5; The 'summing' of applicant is the summation of the products of all the x_is and w_is in node 'f' of Mehrotra.); and applying the summed input to a transfer function associated with a neuron in the trained neural network. (**Mehrotra,** p11, Figure 1.5; The 'transfer function' of applicant is equivalent to '$f(w_1x_1 + \ldots + w_nx_n)$' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by summing the product of the weights and input values as input to a function as

taught by Mehrotra to have multiply received input parameters by the weight vector to generate weighted parameters; summing the weighted parameters and the bias value to generate a summed input; and applying the summed input to a transfer function associated with a neuron in the trained neural network.

For the purpose of generating a input value for a function.

Claim 31

NMAB-497 teaches wherein the one or more input parameters relating to a completed repair of the structure relate to a repair performed on an aircraft. (**NMAB-497,** p11:8-25; 'Input parameters relating to a completed repair' of applicant is illustrated by 'materials and processes' of NMAB-497.)

Claim 32

NMAB-497 teaches wherein the at least one aeroelastic analysis result is generated after the completed repair is completed and before the aircraft is used for flight. (**NMAB-497,** p41:3 through p43:28; 'Aeroelastic analysis ... before the aircraft is used in flight' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 33

NMAB-497 teaches wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft. (**NMAB-497,** p29:3 through p30:31; 'Tail

section' of applicant is equivalent to 'horizontal tail and 'vertical tail' of NMAB-497.)

Claim 34

NMAB-497 does not teach wherein the neural network is a feed forward neural network.

Mehrotra teaches wherein the neural network is a feed forward neural network. (**Mehrotra,** p103:1 through p104:16; 'Feed forward neural network' of applicant is equivalent to 'feedforward network' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a feed forward design as taught by Mehrotra to have wherein the neural network is a feed forward neural network.

For the purpose of using back propagation as a training implementation.

Claim 35

NMAB-497 does not teach wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters.

Mehrotra teaches wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters. (**Mehrotra,** p11 Figures 1.5, 1.6; 'Exceed a predetermined category' of applicant is illustrated by the results of the output node based on the step

function. Below a given net value the output is 'off' and above a given net value the output is 'on' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using physical measurements as taught by Mehrotra to have wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters.

For the purpose of using the invention of a physical object.

Claim 36

NMAB-497 teaches wherein the structure is an aircraft. (**NMAB-497,** p11:8-25; 'Aircraft' of applicant is equivalent to 'aircraft' of NMAB_497.)

Claim 37

NMAB-497 teaches wherein the step of determining aeroelastic characteristics of the structure based in part on the trained neural network is performed after the completed repair is completed and before the aircraft is used for flight. (**NMAB-497,** p41:3 through p43:28; 'Aeroelastic analysis ... before the aircraft is used in flight' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497. 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.)

Claim 38

NMAB-497 teaches wherein the structure is at least one of a stabilator, a

wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft. (**NMAB-497,** p29:3 through p30:31; 'Tail section' of applicant is equivalent to 'horizontal tail and 'vertical tail' of NMAB-497.)

Claim 39

NMAB-497 does not teach wherein the neural network is a feed forward neural network.

Mehrotra teaches wherein the neural network is a feed forward neural network. (**Mehrotra,** p103:1 through p104:16; 'Feed forward neural network' of applicant is equivalent to 'feedforward network' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a feed forward design as taught by Mehrotra to have wherein the neural network is a feed forward neural network.

For the purpose of using back propagation as a training implementation.

Claim 40

NMAB-497 teaches wherein the step of determining input parameters further comprises: determining a weight; and determining a location of the weight relating to the one or more completed repairs performed on the structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion

that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

Claim 41

NMAB-497 teaches wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

NMAB-497 does not teach exceed a predetermined category of approved repair parameters.

Mehrotra teaches exceed a predetermined category of approved repair parameters. (**Mehrotra,** p11 Figures 1.5, 1.6; 'Exceed a predetermined category' of applicant is illustrated by the results of the output node based on the step function. Below a given net value the output is 'off' and above a given net value the output is 'on' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using physical measurements as taught by Mehrotra to have

wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure.

For the purpose of using the invention on a physical structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of NMAB_497 and Mehrotra in view of Hampton. (U. S. Patent 4840069, referred to as **Hampton**)

Claim 3

NMAB_497 and Mehrotra do not teach wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial.

Hampton teaches wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial. (**Hampton,** C5:5-12; 'Switch' of applicant is equivalent to 'switch' of Hampton.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by using physical devices of a computer as taught by Hampton to have wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial.

For the purpose of being able to input data into the invention.

Claim 4

NMAB_497 and Mehrotra do not teach wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector.

Hampton teaches wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector. (**Hampton,** C2:46-51; 'Receiver' of applicant is equivalent to 'receiver' of Hampton.) It would have

been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by having physical monitoring devices as taught by Hampton to have wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector.

For the purpose of measuring data from a physical structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of NMAB_497 and Mehrotra in view of Hockey. (U. S. Patent 6014024, referred to as **Hockey**)

Claim 13

NMAB_497 and Mehrotra do not teach wherein the at least one aeroelastic analysis result comprises a contour plot of store loads.

Hockey teaches wherein the at least one aeroelastic analysis result comprises a contour plot of store loads. (**Hockey,** Figure 7c, C1:29-36, C3:9-47; 'Contour plot' of applicant is equivalent to 'contour plot of Hockey.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by generating a contour plot as taught by Hockey to have wherein the at least one aeroelastic analysis result comprises a contour plot of store loads.

For the purpose of graphically displaying information to provide a visual interpretation of the input data.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-26, 28-30, 42-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of NMAB_497 and Mehrotra in view of Rodgers. (U. S. Patent 5746391, referred to as **Rodgers**)

Claim 21

NMAB-497 teaches receiving at least one input parameter related to a completed repair of an aircraft structure (**NMAB-497,** p11:8-25; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497.); applying a predetermined neural network transfer function (**NMAB-497,** p41:3 through p43:28; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.) to the at least one input parameter to generate an aeroelastic analysis result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.), wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight. (**NMAB-497,** p41:3 through p43:28; 'Repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

NMAB-497 and Mehrotra do not teach outputting the result.

Rodgers teaches outputting the result. (**Rodgers,** C6:31-42; 'Outputting the result' of applicant is equivalent to 'processor analyses ... to determine the amount of flutter' of Rodgers.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined

teachings of NMAB-497 and Mehrotra by generating a flutter result as taught by Rodgers to outputting the result.

For the purpose of analyzing a repair for flutter analysis and determining characteristics for acceptable flight.

Claim 22

NMAB-497 teaches wherein receiving at least one input parameter comprises: receiving a weight; and receiving location of the weight on the aircraft structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

Claim 23

NMAB-497 does not teach multiplying the at least one input parameter with a weight vector to produce at least one weighted input parameter; summing together the at least one weighted input parameter and a bias value to generate a summed value; and applying a neuron transfer function to the summed value.

Mehrotra teaches multiplying the at least one input parameter with a weight vector to produce at least one weighted input parameter (**Mehrotra,** p11, Figure 1.5; The 'Multiplying received input parameters' of applicant is the

multiplication of each x_is and w_is in node 'f' of Mehrotra.); summing together the at least one weighted input parameter and a bias value to generate a summed value (**Mehrotra,** p11, Figure 1.5; The 'summing' of applicant is the summation of the products of all the x_is and w_is in node 'f' of Mehrotra.); and applying a neuron transfer function to the summed value. (**Mehrotra,** p11, Figure 1.5; The 'transfer function' of applicant is equivalent to '$f(w_1x_1 + ... + w_nx_n)$' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using a standard neural network algorithm as taught by Mehrotra to multiply the at least one input parameter with a weight vector to produce at least one weighted input parameter; summing together the at least one weighted input parameter and a bias value to generate a summed value; and applying a neuron transfer function to the summed value.

For the purpose of taking advantage of a neural network pattern identification strengths.

Claim 24

NMAB-497 teaches wherein the aeroelastic analysis result comprises a flutter speed at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this is the

flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 25

NMAB-497 teaches wherein the aeroelastic analysis result comprises a flutter frequency at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this is the flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 26

NMAB-497 teaches wherein the aeroelastic analysis result comprises a flutter speed and an associated flutter frequency at a damping value. (**NMAB_497,** p29:3 through p30:31; 'Flutter frequency at a damping value' of applicant is described in the 'Structural Dynamics and Aeroelasticity' section of NMAB-497. Aerodynamic damping forces cause a structural motion that can lead to a dynamic instability called flutter. When aeroelastic mode sinks to zero and some critical speed, this is the flutter speed. 'Flutter frequency' of applicant is equivalent to 'aeroelastic mode' value of NMAB-497.)

Claim 28

NMAB-497 teaches receiving at least one input parameter related to a completed repair of an aircraft structure (**NMAB-497,** p11:8-25; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497.); applying a predetermined neural network transfer function (**NMAB-497,** p41:3 through p43:28; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.) to the at least one input parameter to generate an aeroelastic analysis result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.), wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight. (**NMAB-497,** p41:3 through p43:28; 'Repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

NMAB-497 and Mehrotra do not teach outputting the result.

Rodgers teaches outputting the result. (**Rodgers,** C6:31-42; 'Outputting the result' of applicant is equivalent to 'processor analyses ... to determine the amount of flutter' of Rodgers.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by generating a flutter result as taught by Rodgers to outputting the result.

For the purpose of analyzing a repair for flutter analysis and determining characteristics for acceptable flight.

Claim 29

NMAB-497 teaches receiving a mass input related to a completed repair; receiving a location of the mass on an aircraft structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

NMAB-497 does not teach multiplying the mass input and location with a weight vector to produce weighted input parameters; summing together weighted input parameters and a bias value to generate a summed value.

Mehrotra teaches multiplying the mass input and location with a weight vector to produce weighted input parameters (**Mehrotra,** p11, Figure 1.5; The 'Multiplying the mass input ... with a weight vector' of applicant is the multiplication of each x_is and w_is in node 'f' of Mehrotra.); summing together weighted input parameters and a bias value to generate a summed value. (**Mehrotra,** p11, Figure 1.5; The 'summing' of applicant is the summation of the products of all the x_is and w_is in node 'f' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by multiplying input values with weights and then summing the products as taught by Mehrotra to multiply the mass input and location with a weight vector to produce weighted input parameters; summing

together weighted input parameters and a bias value to generate a summed value.

For the purpose of generating a value as input to a function.

NMAB-497 teaches applying a neuron transfer function (**NMAB-497,** p41:3 through p43:28; 'Neuron transfer function' of applicant is equivalent to 'neural network' of NMAB-497.)to the summed value to generate an aeroelastic analysis flutter result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.), wherein the aeroelastic analysis flutter result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight. (**NMAB-497,**.p41:3 through p43:28; 'Repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

NMAB-497 and Mehrotra do not teach outputting the flutter result.

Rodgers teaches outputting the flutter result. (**Rodgers,** C6:31-42; 'Outputting the result' of applicant is equivalent to 'processor analyses ... to determine the amount of flutter' of Rodgers.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by generating a flutter result as taught by Rodgers to outputting the flutter result.

For the purpose of analyzing a repair for flutter analysis and determining characteristics for acceptable flight.

Claim 30

NMAB-497 teaches means for receiving input parameters relating to a completed repair of an aircraft structure (**NMAB-497,** p11:8-25; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497.); means for applying a neural network transfer function (**NMAB-497,** p41:3 through p43:28; 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.) to the input parameters to generate an aeroelastic analysis result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.), wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight. (**NMAB-497,** p41:3 through p43:28; 'Repairs are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

NMAB-497 and Mehrotra do not teach means for outputting the result.

Rodgers teaches means for outputting the result. (**Rodgers,** C6:31-42; 'Outputting the result' of applicant is equivalent to 'processor analyses ... to determine the amount of flutter' of Rodgers.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by generating a flutter result as taught by Rodgers to have means for outputting the result.

For the purpose of analyzing a repair for flutter analysis and determining characteristics for acceptable flight.

Claim 42

NMAB-497 does not teach wherein the step of applying the predetermined neural network transfer function.

Mehrotra teaches wherein the step of applying the predetermined neural network transfer function. (**Mehrotra,** p11, Figure 1.5; The 'transfer function' of applicant is equivalent to '$f(w_1x_1 + ... + w_nx_n)$' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by generating a result of a function as taught by Mehrotra to have wherein the step of applying the predetermined neural network transfer function.

For the purpose of indicating a positive or negative result for a given pattern.

NMAB-497 teaches to the at least one input parameter to generate the aeroelastic result is performed after the completed repair is completed and before the aircraft structure is used in flight. (**NMAB-497,** p11:8-25, p29-3 through p30:31, p41:3 through p43:28; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered. 'Aeroelastic result' of applicant is equivalent to 'aeroelasticity' of NMAB-497. 'Before the aircraft is used in flight' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 43

NMAB-497 teaches wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight. (**NMAB-497,** p11:8-25, p41:3 through p43:28; 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered. 'Aeroelastic analysis ... before the aircraft is used in flight' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497. 'Neural network' of applicant is equivalent to 'neural network' of NMAB-497.)

Claim 44

NMAB-497 teaches wherein the aircraft structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft. (**NMAB-497,** p29:3 through p30:31; 'Tail section' of applicant is equivalent to 'horizontal tail and 'vertical tail' of NMAB-497.)

Claim 45

NMAB-497 teaches wherein the step of receiving the at least one input parameter comprises: receiving a weight; and receiving a location of the weight relating to the completed repair of the aircraft structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

Claim 46

NMAB-497 teaches wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

NMAB-497 does not teach exceed a predetermined category of approved repair parameters.

Mehrotra teaches exceed a predetermined category of approved repair parameters. (**Mehrotra,** p11 Figures 1.5, 1.6; 'Exceed a predetermined category'

of applicant is illustrated by the results of the output node based on the step function. Below a given net value the output is 'off' and above a given net value the output is 'on' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by indicating a Boolean 'on' or 'off' result as taught by Mehrotra to have exceed a predetermined category of approved repair parameters.

For the purpose of using Boolean methods for positive indication.

Claim 47

NMAB-497 does not teach wherein the step of applying the neuron transfer function to the summed value.

Mehrotra teaches wherein the step of applying the neuron transfer function to the summed value. (**Mehrotra,** p11, Figure 1.5; The 'summing' of applicant is the summation of the products of all the x_is and w_is in node 'f' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by summing a series of products resulting in a input value for a function as taught by Mehrotra to have wherein the step of applying the neuron transfer function to the summed value.

For the purpose of generating an input value for a function in order to use the function.

NMAB-497 and Mehrotra do not teach to generate the aeroelastic flutter result is performed.

Rodgers teaches to generate the aeroelastic flutter result is performed. (**Rodgers,** C6:31-42; 'Generate the aeroelastic flutter' of applicant is equivalent to 'processor analyses ... to determine the amount of flutter' of Rodgers.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB-497 and Mehrotra by generating a flutter result as taught by Rodgers to generate the aeroelastic flutter result is performed.

For the purpose of analyzing a repair for flutter analysis and determining characteristics for acceptable flight.

NMAB-497 teaches after the completed repair is completed and before the aircraft structure is used in flight. (**NMAB-497,** p41:3 through p43:28; 'Repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 48

NMAB-497 does not teach wherein the neural network transfer function is applied to the input parameters.

Mehrotra teaches wherein the neural network transfer function is applied to the input parameters. (**Mehrotra,** p103:1 through p104:16; 'Neural network function' of applicant is accomplished by 'back propagation' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using back

propagation methods as taught by Mehrotra to have wherein the neural network transfer function is applied to the input parameters.

For the purpose of training the neural network.

NMAB-497 teaches to generate the aeroelastic analysis result (**NMAB-497,** p29-3 through p30:31; 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497.), after the completed repair is completed and before the aircraft structure is used in flight. (**NMAB-497,** p41:3 through p43:28; 'Repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497.)

Claim 49

NMAB-497 teaches receiving a weight; and receiving a location of the weight relating to the completed repair of the aircraft structure. (**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

Claim 50

NMAB-497 teaches wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure.

(**NMAB-497,** p11:8-25; 'Weight and location on the structure' of applicant is illustrated by 'materials and processes' of NMAB-497. It is the Examiner's opinion that one skilled within the art would understand that both the location of the repair and the mass of the materials used for the repair is critical information for analysis of the repair. This is due to following the repair both aerodynamics and the center of gravity of the aircraft can be altered.)

NMAB-497 does not teach exceeding a predetermined category of approved repair parameters.

Mehrotra teaches exceed a predetermined category of approved repair parameters. (**Mehrotra,** p11 Figures 1.5, 1.6; 'Exceed a predetermined category' of applicant is illustrated by the results of the output node based on the step function. Below a given net value the output is 'off' and above a given net value the output is 'on' of Mehrotra.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of NMAB-497 by using Boolean results as an indicator as taught by Mehrotra to wherein the neural network transfer function is applied to the input parameters.

For the purpose of a result of 'on' or 'off' as a indicator.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of NMAB_497, Mehrotra and Rodgers in view of Hockey. (U. S. Patent 6014024, referred to as **Hockey**)

Claim 27

NMAB_497, Mehrotra and Rodgers do not teach wherein the at least one aeroelastic analysis result comprises a contour plot of store loads.

Hockey teaches wherein the at least one aeroelastic analysis result comprises a contour plot of store loads. (**Hockey,** Figure 7c, C1:29-36, C3:9-47; 'Contour plot' of applicant is equivalent to 'contour plot of Hockey.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the combined teachings of NMAB_497, Mehrotra and Rodgers by generating a contour plot as taught by Hockey to have wherein the at least one aeroelastic analysis result comprises a contour plot of store loads.

For the purpose of graphically displaying information to provide a visual interpretation of the input data.

Response to Arguments

5. Applicant's arguments filed on July 9, 2007 for claims 1-13, 17-50 have been fully considered but are not persuasive.

6. In reference to the Applicant's argument:

REMARKS
On February 5, 2007, an amendment and Request for Continued Examination was filed in response to Advisory Action of December 21, 2006. On April 12, 2007, the Office Action was mailed in which the amendments of February 5, 2007, were entered but none of the pending claims were allowed. Claims 1-13 and 17-50 are pending in the application. Independent claims 1, 17, 21, 28, 29, and 30 have been amended. Reconsideration of the present application in view of the amendments and the following remarks is respectfully requested.

Claim Rejections - 35 U.S.C. §101
Independent claims 1, 17, 21, 28, 29, and 30 stand rejected under 35 U.S.C. §101 for nonstatutory subject matter as not being limited to a substantial practical application. Applicant respectfully submits that independent claims 1, 17, 21, 28, 29 and 30 have been amended to recite a substantial practical application in accordance with 35 U.S.C. § 101 and are, therefore, in condition for allowance.

Independent claim 1 has been amended to recite "wherein the at least one aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable." As a result, independent claim 1 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 2-13 and 31- 35 which depend from allowable independent claim 1 are therefore also allowable.

Independent claim 17 has been amended to recite "determining whether the aeroelastic characteristics of the structure with the one or more completed repairs are acceptable." As a result, independent claim 17 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 18-20 and 36-41 which depend from allowable independent claim 17 are therefore also allowable.

Independent claim 21 has been amended to recite "wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the

completed repair is acceptable
for flight ....

"As a result, independent claim 21 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 22-27 and 42-44 which depend from allowable independent claim 21 are therefore also allowable.

Independent claim 28 has been amended to recite "wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable
for flight ....

"As a result, independent claim 28 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 45-48 which depend from allowable independent claim 28 are therefore also allowable.

Independent claim 29 has been amended to recite "wherein the aeroelastic analysis flutter result may be used to determine whether the aircraft structure with the completed repair is
acceptable for flight ....

"As a result, independent claim 29 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 49-51 which depend from allowable independent claim 29 are therefore also allowable.

Independent claim 30 has been amended to recite "wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable
for flight ....

"As a result, independent claim 30 recites a substantial practical application in accordance with 35 U.S.C. § 101 and is allowable. Claims 52-55 which depend from allowable independent claim 30 are therefore also allowable.

Examiner's response:

In light of the amended claims the Examiner withdraws the amended claims under 35 U. S. C. §101. The amended claims alter the scope of the invention and the Examiner uses NMAB-497, Mehrotra and Rodgers for all of the independent claims. In claim 1, 'Input parameters' of applicant is illustrated by 'materials and processes' of NMAB-497. (**NMAB-497,** p11:8-25) 'Neural

network' of applicant is equivalent to 'neural network' of NMAB-497. (**NMAB-497,** p41:3 through p43:28) 'Aeroelastic analysis' of applicant is equivalent to 'aeroelasticity' of NMAB-497. (**NMAB-497,** p29-3 through p30:31) 'Trained neural network' of applicant is accomplished by 'back propagation' of Mehrotra. (**Mehrotra,** p103:1 through p104:16) 'Determine ... aeroelastic characteristics ... repair are acceptable' of applicant is disclosed by the 'certification of bonded repairs' of NMAB-497. (**NMAB-497,** p41:3 through p43:28)

Examination Considerations

7. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has the full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

8. Examiner's Notes are provided to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to

further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and sprit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but link to prior art that one of ordinary skill in the art would find inherently appropriate.

9. Examiner's Opinion: Paragraphs 7 and 8 apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Claims 1-13, 17-50 are rejected.

Correspondence Information

12. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor David Vincent can be reached at (571) 272-3080. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

Receptionist,

Customer Service Window,

Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 272-3150 (for formal communications intended for entry.)

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Peter Coughlan

8/30/2007

JOSEPH P HIRL
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